NOVEMBER/DECEMBER 2023

GCH13/DCH13 — PHYSICAL CHEMISTRY - I

Time : Three hours Maximum : 75 marks

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SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define the term activity coefficient.
2. What are partial molar properties?
3. State reduced phase rule.
4. What is congruent melting?
5. What are surfactants?
6. State the significance of gold number in protective colloids.
7. Write the importance of Taft equation.
8. What are potential energy surfaces?
9. What are acid-base catalyst?
10. How enzyme catalytic activity varies with temperature?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Explain the variation of chemical potential with temperature and pressure.

Or

(b) Discuss the determination of fugacity of gases by graphical method.

12. (a) Discuss the phase diagram of NaCl-H_2O system.

Or

(b) Explain the phase diagram of water-ethyl-alcohol-succinic nitrile system.

13. (a) Derive the expression for zeta potential.

Or

(b) Write a note on micro emulsion formed by liquid phases.

14. (a) Write a note on kinetic isotopic effect.

Or

(b) Derive Bjerrum-Bronsted equation.

15. (a) Explain about Bronsted catalysis law.

Or

(b) State the differences between competitive, non-competitive and uncompetitive inhibition.

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SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. (a) Discuss the emf method for determining activity coefficient. (5)

(b) Explain how fugacity varies with pressure. (5)

17. (a) Discuss the salient features of hydrate formation system. (7)

(b) Sketch the phase diagram of acetic acid – chloroform – water system. (3)

18. Discuss about various factors which affects CMC in aqeous medium.

19. Explain in detail about ARR theory.

20. Derive Michaelis – Menten equation with its interpretation.